Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

VOL. VI. NO. 23. NOVEMBER 11, 1909

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

SPACE

SPACE has seemed to many thinkers an easier category than time or causality. Personally, I regard it as more difficult to handle than either of these other categories. Not only is it intimately bound up with these, but it is also, so to phrase it, the key to substance.

There are two ways of approach to space as to the other categories, the empirical and the ontological or metaphysical. The empirical study is a necessary preliminary to the metaphysical. It sharpens the vision and sets the problem. Without it, the thinker who attacks ultimate questions can only grope in darkness. I shall presuppose, accordingly, in the following analysis that the reader is able to distinguish between perceptual, normal empirical, and mathematical space, and knows somewhat of their genetic and logical nature.

Is reality spatial? This question has interested me vitally for a considerable time. The reason for this interest is not far to seek. If reality is spatial how can we place consciousness in it? Is such a location of consciousness in a spatial universe possible as will avoid dualism and do justice to the *motives* lying back of the double aspect theory of the relation of mind and body without the acceptance of that theory itself? Can we settle consciousness in a spatial universe clearly and definitely without giving it more nor less than its due?

But I may be accused of using an ambiguous term without definition. What is this reality concerning which I inquire whether it is spatial or not? I do not hesitate to answer—however materialistic it may sound—that reality for me is nature, and consists of such things as I can handle or affect indirectly through machines, be they dynamos or levers. But, while I am a naturalist, I am not so sure of the entire nature of this nature as are the materialists and energists. If I can settle consciousness inside as a *constituent* of certain highly organized parts of nature—while *not coextensive* with those parts, as the double-aspect theory would have it—I may be able to pave the way for peace between these factions. Nature is, then, for me the ultimate term; but I am convinced that she has been eviscerated by materialists and enervated by idealists. Theory has never done justice in a critical way to her inwardness, to her volume-continuity and activity and content, so to speak; mechanics universalizes surface analogies.

Is nature spatial? Science asserts that it is. Everywhere in physics are calculations which deal with distance, and astronomy produces magnitudes which astonish the imagination. Is philosophy able to agree with science on this point, or is it forced by its analysis to deny what seems so apparent to common sense when it looks from the mountain top, or crosses the ocean, or digs a ditch, and to science when it calculates the return of a comet two hundred years hence?

Philosophy has met the weighty arguments of science and common sense in two main ways. It has either made the distinction between phenomena which are spatial and reality which is not, or it has maintained that reality is experience.

Those who assert that reality is experience are divided into two main camps, the absolutists and the empiricists. The first are definitely opposed to the spatial character of reality. (Taylor and Bradley have taken a definite position against space.) The second party have not as yet clearly expressed themselves. Certainly, however, some thing-experiences are spatial in character even though they lack stability and vanish like gossamer threads. My purpose, however, is not critical, but constructive. I wish to present a view which may withstand criticism. Accordingly, I leave idealism to satisfy those whom it can satisfy.

The typically Kantian position, which was referred to above, seems to me, in its doctrine regarding space, to be an inadequately justified assumption. The fact that our thing-experiences, whether at the perceptual or completely categorized level, are spatial does not imply that nature apart from our experience—for Kant, the noumenal world—is not also spatial. Experiential space may correspond to the spatial character of nature as she exists independently of the individual's experience. What is necessary is a critical study of what we should mean by space if this were so. The "Transcendental Æsthetic" does not disprove such a position; it does not even concern itself with anything but the most naïve realism in regard to space, which, of course, it easily conquers. If, then, one could prove that the things he handles, and measures, and superposes upon one another have an existence independent of his thing-experiences which correspond to them, no adequate reason for denying spatiality to nature in herself would remain. Things in nature, as a macrocosm which includes our body, do exclude one another. All our methods of automatic registration and measurement indicate this. Only an unconquerable logical contradiction, accordingly, would give us the *right* to be sceptical.

But it may be replied that, in the "Dialectic," Kant has advanced an argument against the spatial character of reality. I do not read it so. It seems to me, again, only directed against naïve realism, the belief that the world of our construction exists by itself. Even if the antinomy stands under modern mathematical definition, this is all it could prove. It is really only supplementary to the "Æsthetic" and is powerless to affect the argument for the spatial character of reality as existent independently of our construction.

Can the spatial character of reality be indicated apart from all questions of finite and of infinite? I think so; I even regard it as a mistake to suppose that this problem of the finiteness or infinity of our universe has any bearing upon whether or not reality is actually spatial. Rather, if we believe that nature, as a construction, must always take its departure from the body, as a part of nature as reality, the reason why this antinomy arises is clear. Its basis is essentially motor. We have found no limit to our advance by proxy, *i. e.*, by telescope and calculation. The mathematical infinite, as variable, portrays this progress in experience. The mathematical infinite is an instrument, not a reality, and is intimately bound up with number analysis, and has only an indirect connection with physical space—a connection which, as Poincaré has pointed out in the case of continuity, has had, however, a healthy influence.

Another logical difficulty has had a baleful effect upon our problem. It is here that the empirical study to which I referred at the beginning is as a lamp to our feet. It shows us that space is neither a receptacle nor a thing, but that in nature things are experienced, and thought of, as extended and in dynamic relation one with another. Extension has here a basis in measurement, and has grown in importance with the need felt for exact measurement. Instruments and standards rather than mathematical conception give us the meaning of "extended" in nature. That this was true from the first the history of mathematics evidences.[1] We are now prepared for the logical difficulty. If things, as parts of reality, are extended, do they possess extension as an attribute? I reply that *in reality there are no attributes.* To think of reality in this fashion is to carry over a logical realism uncritically, as did Descartes and Spinoza. The division into subject and qualities, or attributes, is of value in reflective analysis in experience, but even in non-reflective situations this dichotomy lapses. This is not the place for the detailed study of this reflective instrument. I content myself with saying that there is no necessity to transfer a subject-substance and inherent attributes into reality and much reason against such fatuity. But because reality does not possess attributes, it is not, therefore, wrong to analyze nature and to think of it in certain diverse ways. Only he who has a false idea of the rapport, or correspondence, of our individual experience and nature as macrocosm, could assert this. To conclude, things are extended, but extension is not an attribute.

---

[1] *Vide,* Mach, "Space and Geometry."

If, then, reality is extended how shall we best understand this extension? Certainly not as geometrical space which is attained only by abstraction and idealization. This is not, however, to deny the utility of mathematics in science. Rather is it along the line of activity and organization that we must proceed. But in this region scientific experiment alone can give our idea clear definition. The meanings which go to make our idea of the voluminous character of nature are at once seen to be many. All the so-called primary qualities enter together. Things are relatively impenetrable, relatively solid, and relatively hard. It is not from isolated particular sensations that these meanings are gathered, but rather from experience of the reaction of different things on one another. Physics in its study of comparative densities, tenacities, hardnesses, and physical chemistry in its examination of the effect of temperature and pressure, are the complex grounds on which we judge. Certainly I do not wish to objectify a pressure sensation or a motor sensation, but that things cut one another or melt, or exclude, one another is as evident as that my body moves. It is not these facts that need to be overturned, but a false logic and theory of knowledge. The ''substance-attributes'' method of approach to reality, which for Berkeley formed the basis of any naturalistic realism and in conquering which he thought he had destroyed this latter, is not the true basis. Reality does not possess attributes which our ideas resemble.[2]

Evidently I have supported all that science could demand of metaphysics as a basis for its postulates. Science, yes; but not materialism. All this holds of the brain also as a part of nature; is consciousness therefore excluded?

---

[2] Not resemblance, but tested correspondence which always has a motor basis, is the characteristic of ontological truth. I use the term ontological truth to characterize the rapport of our ideas with nature as reality, and empirical truth to indicate a relation within experience itself between ideas and perceptual experiences or other ideas. It is the confusion of these two kinds of truth that leads us to carry over uncritically the idea of resemblance which often holds in empirical truth to this other field. This paralogism is hard to conquer, so natural to us is uncritical realism. It is impossible to develop this distinction and its implications in this place, for it would carry us too far afield. We can at least affirm that the tested structure and activities of things in our experience correspond to, and are hence symbolic of, the structure and activities of things in reality.

In order to give the answer to this basal problem its proper setting, a digression is necessary. While there is no need to enter here in detail into the development of a critical attitude towards our experience, certain distinctions which have grown up must be noted. It is the misunderstanding of these distinctions that has led to the exclusion of consciousness from nature and hence to the belief in an ultimate and unconquerable dualism.

Before criticism enters into experience in any organized fashion common sense holds sway. Its view may be called natural realism. Things are regarded, *not as experiences, but as experienced.* This world of things, or nature, gradually had certain meanings assigned to it which have been carried farther and with greater exactitude and penetration by science. All these meanings are, I believe, necessary, inevitable, and correct, and stand for, and arise from, the nature of reality and of our position therein. But the theoretical interpretation of them has not been right. For our purpose the meaning which interests us most is that of independence, for existence, of the experiencer's mind. This independence of mind, which was a *theory-of-knowledge independence,* meeting the soul-body dualism, which had developed largely from different motives, was confused with it. A subject-object, or, better still, a mind-object, dualism linked itself with an entirely different, supposed soul-body dualism. This confusion was aided by the development of psychology, whose view-point, being that of a special science, supported rather than destroyed this fateful identification. To sum up: we have, as a result of this movement, the independence of nature of the individual's experiencing interpreted as an exclusion by nature of mind, *i. e.,* a supposed epistemological independence interpreted as an existential exclusion.

Now logical theory has attacked the epistemological dualism and made a duality of it, *i. e.,* a working, useful and inevitable distinction in the individual's mind. But psychology, holding still to the science point of view, makes the mind run, as it were, alongside a world of objects which it somehow knows but can not penetrate. Sometimes psychology has, indeed, been idealistic, but this was when its own conclusions weighed too heavily on its conscience. How can we satisfy the realistic feeling of science and common sense and, at the same time, the demands of logic? Let me not be ashamed of the faith that is in me. I say without hesitation, that only critical realism can do this. Thing-experiences are in my mind but the things as parts of reality, which correspond to these thing-experiences, are not in my mind. *This exclusion is not based on the original theory which led to the exclusion of mind as such from nature.* My mind is excluded from the other parts of reality simply because it is found to be connected with only one thing, *viz.*, my body. When this logical and metaphysical analysis is once grasped, the epistemological dualism which led to the exclusion of mind from nature is seen to lapse. Let me put this analysis in a slightly different form in order to make sure that I am understood even if not agreed with. In reflection, an inevitable distinction arises between that which is accepted as a background and framework and that which is in process of testing and evaluation. When reflection is centered on nature, on perceived things, this framework is very stable. The resulting dichotomy, expressed in popular thought as that between things and ideas, has overflowed its limits and made of this distinction the ultimate existential dualism of science and common sense. Thoughts, feelings, and ideas were classified as mind, and looked upon as outside things which were spatial and different from it. How natural this was! But this is now seen to be the exclusion of one functional type of experience from another type. Gradually psychology drew *sensation?* also into this realm of mind, and the tortuous riddles of an insoluble, because wrongly based, epistemology had birth.

As a result of our whole analysis we have thus far achieved two main conclusions. Reality or nature is extended, organized, and active, and consciousness is not excluded from it, is not alien to it, but consciousness does not float free in nature as a ship without moorings. Physiology and psychology, normal and abnormal, indicate that it is born and dies with every pulse of attention. Is it necessary to repeat the arguments for this location of the individual's consciousness? I think not. Every thinker is, or should be, familiar with them.

Things in reality, although in dynamic continuity, exclude one another, but consciousness, the flow of experiencing, is not a stuff nor a thing alongside other things. It is a *variant* in the changes occurring in that part of reality we call the brain. In it alone are we on the inside of reality and participators in its process. It is a light that guides, but a light kindled by reality as friction kindles a flame.

If any one calls this position dualistic I can only answer that he has not understood my argument and still lingers in the dualism of natural realism, be it that of common sense or the sharpened Cartesian type. Neither is this position similar to the double-aspect theory. The double-aspect theory (*e. g.*, that of Ebbinghaus) is an attempt at logical legerdemain. It seeks to overcome dualism by words and not by a profounder analysis. How, pray, can we think of substance as the possessor of aspects? But the motives that led to this theory must give it precedence to materialism.

With the results of this study as a basis, we shall at last be able to examine thoroughly the problem of ontological causation with the question of the efficiency of this variant, consciousness, as an illuminating point of departure.[3]

ROY WOOD SELLARS.

UNIVERSITY OF MICHIGAN.

THE PERCEPTUAL BASIS FOR JUDGMENTS OF EXTENT

IN 1887, in the course of experiments on the extent of movement, Loeb[1] was led to the supposition that the judgment of extent is based on the perception of the duration of the movement. Since then Kramer and Moskiewicz,[2] in 1901, and Jaensch,[3] in 1905, have felt that their experimental results led to the same conclusion. Woodworth,[4] in 1903, discredits the hypothesis. His chief objections are: (1) Duration may be varied without entirely destroying the approximate equality of the extents; (2) extent can be judged better than time; (3) compensatory constant errors with higher speed are insufficient; (4) if we judged by duration alone, speed distinctions would be reduced to a matter of visual space or perception of force.

In June, 1909, the writer published, along with other matter,[5] the result of a long series of experiments on the relation between the judgments of extent and duration in the case of rectilinear arm movements. His conclusion there was that "the experimental facts point to separate processes of judgment for the two magnitudes, extent and duration. The four methods of separate accuracy tests, confusion, correlation, and correction failed to justify the assumption that the perception of any one characteristic of a movement is more primitive or fundamental than that of any other. The judgment of extent seems to be based on a system of signs which have been learned to mean extent directly. The same seems to be true of both duration and velocity."[6]

In the July (1909) number of the *American Journal of Psychol-*

---

[3] See, however, an article on causality, this JOURNAL, Vol. VI., pp. 323-328.

[1] *Pflüger's Archiv*, 41, p. 124, 1887.

[2] *Zeitschrift für Psychologie*, 25, pp. 101-125, 1901.

[3] *Ibid.*, 41, pp. 257-279, 1905.

[4] "Le Mouvement," Chap. IV.

[5] "The Inaccuracy of Movement," H. L. Hollingworth, *Archives of Psychology*, No. 13, 1909.

[6] *Ibid.*, pp. 85-86.